

Interview Summary	Application No. 10/648,052	Applicant(s) BAURCEANU ET AL.	
	Examiner Colleen P. Cooke	Art Unit 1754	

All participants (applicant, applicant's representative, PTO personnel):

- (1) Colleen P. Cooke. (3) _____
 (2) Harry Levy. (4) _____

Date of Interview: 05 September 2005.

Type: a) ☒ Telephonic b) ☐ Video Conference
 c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
 If Yes, brief description: _____.

Claim(s) discussed: N/A.

Identification of prior art discussed: Onabe et al.

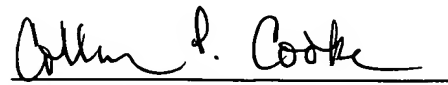
Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The examiner, upon reviewing applicant's response, requested a copy of the calculations relied upon by the applicant to determine the range taught by Onabe et al. of atom percent copper; Applicant faxed the calculations (attached).

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.


 Examiner's signature, if required

DATE: 9/6/05

FACSIMILE TRANSMISSION COVER PAGE

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SN.
10/648,052

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MESSAGE SENT TO: Mr. Harry Levy
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(Division) (Phone No.)Transmission consists of 1 + 1 pages (cover page plus text)

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Ref: Your Case 273 (ANL-IN-03-023)

Good morning Harry. Enclosed hand written notes show how I calculated the atom. % of copper reported by Orsini et al. based on their range of 50 - 300 $\mu\text{g Cu}/\text{in}^2$. As you heard from my answering machine, I was on travel on last Thursday & ~~last~~ Friday. Call me if you want to talk about this.

Best regards.

Balu

emrichintl@aol.com

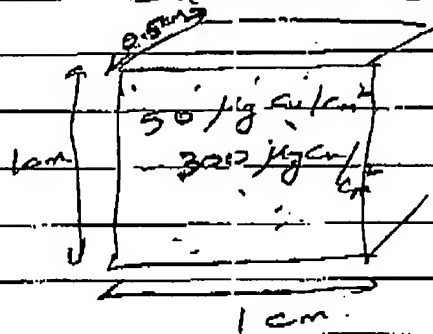
21

Calculating the amt. of Copper for the range $50 \mu\text{g}/\text{cm}^2$ -
 $300 \mu\text{g}/\text{cm}^2$ ~~is~~ reported in Onale et al
 patent.

Density of Copper = $8920 \text{ kg}/\text{m}^3$

Silver = $10,490 \text{ kg}/\text{m}^3$

Substrate size = $10 \text{ mm} \times 10 \text{ mm} \times 0.5 \text{ mm}$



The substrate is 0.5 mm i.e. $500 \mu\text{m}$
 thick. Assume as $500 \mu\text{m}$ thick
 substrate is divided into 50 layers
 of 1 cm^2 area. This assumption
 will be used throughout this analysis.

Each layer contains $50 \mu\text{g}$ of Copper

Total amount of Copper in the

substrate

$$= 50 \times 500 = 25,000 \mu\text{g}$$

Now for the amount of Silver in the substrate.

Copper

Density = $10,490 \text{ kg}/\text{m}^3 = 10.49 \text{ gm}/\text{cm}^3$

Volume of substrate $(10 \text{ mm} \times 10 \text{ mm} \times 0.5 \text{ mm}) = 0.5 \text{ cm}^3$

i.e. wt. of silver in the substrate = 5.25 gm .

There are 500 layers of 1 cm^2 area each

so amount of Silver per cm^2 area = 5.25 gm

$$\frac{5.25}{500} = \frac{5.25}{5 \times 10^2} \times 10^6 \mu\text{g}/\text{cm}^2$$

$$= \frac{5.25 \times 10^4}{5} \mu\text{g Ag}/\text{cm}^2$$

$$= 1.05 \times 10^4 \mu\text{g Ag}/\text{cm}^2$$

2

we have $50 \mu\text{g Cu/cm}^2$ and $1.05 \times 10^4 \mu\text{g Ag/cm}^2$

$$\therefore \text{wt. \% of Copper in the diffusion layer} = \frac{50}{1.05 \times 10^4} \times 100 \text{ wt. \% Cu}$$

$\therefore 50 \mu\text{g}$ added to $1.05 \times 10^4 \mu\text{g}$ is not making much difference!

$$\left. \begin{array}{l} \text{wt. \% of Copper in the} \\ \text{diffusion layer} \end{array} \right\} = \frac{5 \times 10^3}{1.05 \times 10^4} = \frac{5}{1.05} \times 10^{-1} = \underline{\underline{0.476 \text{ wt. \%}}}$$

$$\therefore 50 \mu\text{g Cu/cm}^2 \approx 0.476 \text{ wt. \% Cu}$$

$$\text{Atomic weight of Copper} = 63.546$$

$$\therefore \text{Atomic \% of Copper} = \frac{0.476 \times 100}{63.546} = \underline{\underline{0.749 \text{ Atom. \%}}}$$

$$\text{Atomic weight of Silver} = 107.8682$$

$$\therefore \text{Atomic \% of Silver} = \frac{100 - 0.749}{107.8682} \times 100 = \underline{\underline{92.264\%}}$$

$\therefore 50 \mu\text{g/cm}^2$ of Copper translates into $0.749 \text{ atom. \% Copper}$

$\therefore 300 \mu\text{g/cm}^2 = 4.494 \text{ atom. \% Copper}$

$$\therefore \left. \begin{array}{l} \text{Range of Copper covered in the} \\ \text{Oxide = Patent} \end{array} \right\} = \underline{\underline{0.75 - 4.50 \text{ atom. \%}}}$$

Whereas we claim only to 0.3 atom. \%

with an optimum of $0.2 \text{ atom. \% Copper}$